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Auditor choice and accruals patterns of cross-listed firms

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ABSTRACT

We examine the association between auditor choice and the accruals patterns of Chinese listed firms that cross-list in Hong Kong. Our evidence suggests that the clients of Big 4 auditors report lower unsigned discretionary accruals relative to the clients of non-Big 4 auditors. Further, we find that cross-listed firms with non-Big 4 auditors are more likely to understate their earnings and experience larger reversals of accruals in the future than cross-listed firms with Big 4 auditors. These findings suggest that Big 4 auditors play a meaningful role in improving earnings quality for cross-listed firms, which helps to explain why cross-listed firms have higher earnings quality than their domestic counterparts, as documented in the previous literature.

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1. Introduction

In this study, we investigate the accruals patterns of Chinese listed firms that cross-list on the Hong Kong Stock Exchange (HKEx) to shed light on the role of auditor choice in improving cross-listed firms' accounting quality. The extant literature shows that firms that cross-list on US exchanges have higher earnings quality. For instance, they have less aggressive earnings management, more conservative earnings, more timely loss recognition and a stronger association between accounting data and share prices, compared with non-cross-listed firms in their home markets (Lang et al., 2003; Huikgen and Lubberink, 2005). However, as Leuz (2006, p. 298) notes, "the mechanism by which cross listings improve corporate behavior is not well understood."

In this spirit, this study focuses on the effects of auditor choice on the characteristics of earnings for cross-listed firms in China. Previous research demonstrates the role of auditors in constraining firms' ability to manipulate earnings (e.g., Becker et al., 1998; Francis et al., 1999). Thus, the characteristics of reported accounting data should be jointly shaped by managers and auditors. By examining the effect of auditor choice, we can identify a specific channel that helps to explain why cross-listed firms have better accounting quality than non-cross-listed firms.

In particular, we are interested in investigating whether there are systematic differences in the accruals-based earnings of clients of Big 4 and non-Big 4 auditors.¹ Francis et al. (2009, p. 53) demonstrate that accruals can map onto earnings quality because accruals are the product of estimations and judgments by managers about future events and managers have discretion to distort accruals opportunistically to meet earnings targets. Furthermore, a number of studies have sought to link auditor size to accruals patterns and found that Big 4 clients have lower abnormal accruals than non-Big 4 clients, consistent with the theory that larger auditors are more effective at constraining opportunistic reporting by managers (DeAngelo, 1981; Dye, 1993).

Nevertheless, exactly what drives the difference in audit quality between big and small auditors remains debatable in the extant literature. One explanation is based on reputation. DeAngelo (1981) argues that a large auditor has a greater reputation to lose (greater aggregate reduction in quasi rent) if it provides low-quality audits. An alternative hypothesis is that wealthier auditors are more at risk from litigation and therefore have a greater incentive to issue accurate reports (Dye, 1993). Although several papers conclude that the insurance rationale for audit quality appears to dominate the reputation rationale (Lennox, 1999; Willenborg, 1999; Khurana and Raman, 2004), some studies also show that reputation does matter for audit quality (e.g., Weber et al., 2008).

China's A-share firms cross-listed on HKEx provide a clean setting for us to investigate the reputation rationale of Big 4 audits in an emerging market. The regulations require A-share firms cross-listed on HKEx (referred to as CL firms) to perform dual-audit and dual-reporting, based on Chinese GAAP and IFRS, respectively. Typically, a Hong Kong audit firm provides audit services for a CL firm based on IFRS. At the same time, another domestic audit firm provides audit services for the same firm based on Chinese GAAP. Generally, when a CL firm hires a mainland-based Big 4 firm for financial statement audits based

¹ The term "Big 4" is used because of the collapse of Arthur Andersen in 2002. However, Arthur Andersen was viewed as one of the "Big 5" during our sample period of 1998–2001. The "Big 5" auditors were Deloitte Touche, Ernst & Young, KPMG, PricewaterhouseCoopers and Arthur Andersen.

on Chinese GAAP (referred to as a domestic auditor), it is common practice for the firm to hire the same Big 4 firm in Hong Kong (e.g., KPMG Huazheng versus KPMG Hong Kong) for financial statement audits based on IFRS (referred to as an overseas auditor). Because domestic auditors who provide audit services for CL firms are not exposed to jurisdiction and liability under the stock regulations or laws of Hong Kong, there is no substantial change in their litigation risk. However, given that reputation plays an important role in the Hong Kong audit market, domestic Big 4 member firms may consider the reputation of their Hong Kong counterparts because they share the same international brand name, which in turn changes the incentives of domestic Big 4 member firms and results in lower levels of accruals.

Using a sample of cross-listed firms during the period 1998–2008, we find that firm size and leverage are the two main determinants of whether CL firms hire Big 4 firms to conduct their domestic audits. Moreover, we find that auditor choice affects the pattern of accruals in CL firms. CL firms with domestic Big 4 auditors have lower unsigned total accruals and unsigned abnormal working capital accruals, relative to CL firms audited by non-Big 4 auditors. This finding is robust to controlling for a number of variables, including firm size, leverage, performance, etc. In addition, to mitigate the self-selection problem in auditor choice, we compare the accruals patterns for Big 4 CL clients and non-Big 4 CL clients using a matched sample based on the propensity of CL firms to choose Big 4 auditors, and our conclusions are unchanged. Furthermore, by investigating the components of accruals, we find that the difference between the accruals of Big 4 and non-Big 4 clients can be attributed mainly to differences in the impairment of assets.

One alternative explanation for the above results is the joint (two) Big 4 pair, *per se*, which may supply higher audit quality than other auditor pairs. Francis *et al.* (2009) use France as their research setting, where two (joint) auditors are required by law, and find that firms that use two Big 4 auditors have smaller income-increasing abnormal accruals compared with other firms. To rule out this explanation, we examine the association between auditor choice and accruals using another sample consisting of listed firms that issue both A-shares to domestic investors and B-shares to overseas investors (referred to as AB firms). Before 2007, AB firms were also required to report their accounting data using Chinese GAAP and IFRS and hire domestic and overseas auditors to audit their financial statements. However, AB firms are now subject to regulation by the CSRC and their financial reporting environment is similar to that of other A-share firms. We find that AB firms with Big 4 auditors have higher unsigned total accruals and similar levels of abnormal working capital accruals than AB firms with non-Big 4 auditors. Therefore, two (joint) Big 4 audits does not necessarily enhance audit quality in China.

Our study extends the cross-listing literature by exploring the mechanism by which cross-listing has the potential to improve accounting quality. The paper also contributes to the quality-differential audit literature by providing evidence for how the auditing environment and reputation shape the behavior of Big 4 accounting firms.

The remainder of the paper proceeds as follows. In Section 2, we provide some institutional background on the audit markets in mainland China and Hong Kong and develop our hypotheses. Section 3 details our auditor choice and accruals measures and provides the main empirical results. Section 4 presents additional tests and Section 5 summarizes and concludes the study.

2. Institutional background and hypotheses development

The Tsingtao Brewery Company Limited (A-share code 600600) first issued H-shares (H-share code 00168) in 1993. By the end of 2008, a further 57 domestic firms had issued A-shares and H-shares. According to the HKEx listing rules, all listed firms' accountancy reports must be prepared by certified public accountants who are qualified under the Professional Accountants Ordinance, and such accounting firms must normally have an international name and reputation and be a member of a recognized body of accountants.² Therefore, a domestic firm cross-listing on HKEx must hire a qualified Hong Kong auditor to audit its financial statements based on IFRS. Meanwhile, according to CSRC regulations, A-shares firms must prepare their financial statements based on Chinese GAAP and they must be audited by a designated domestic auditor. Thus, a CL firm is mandated to provide two financial statements (dual-reporting), audited by a domestic auditor and a Hong Kong auditor, respectively. In addition, CL firms must reconcile items for bottom-line net income and shareholders' equity at a fairly summary level.

Hong Kong has consistently been viewed as one of the best financial markets in terms of investor protection. International Big 4 auditors have dominated the audit market in Hong Kong.³ Studies indicate that reputation is important for audit service pricing in Hong Kong. For example, DeFond et al. (2000a) examine the audit fees of Big 6 and non-Big 6 accounting firms using a sample of 348 publicly listed Hong Kong companies and find evidence of Big 6 premiums for both general brand name and for industry specialization. Firth and Lau (2004) analyze the 1997 merger between Kwan Wong Tan and Fong (KWTF) and Deloitte Touche and Tohmatsu (DTT) to become DTT, and the 1998 merger between Coopers and Lybrand (CL) and Price Waterhouse (PW) to form PricewaterhouseCoopers (PwC). Their evidence indicates that there are both across-firm and within-firm pre- and post-merger fee differences between Big 5 and non-Big 5 auditors in Hong Kong. In addition, some cross-country studies on accounting quality suggest that listed firms in Hong Kong have more conservative reported earnings and less earnings management than those in other emerging markets (e.g., Ball et al., 2003; Leuz et al., 2003; Bushman and Piotroski, 2006).

Relative to Hong Kong, China's emerging market is relatively immature and its weak investor protection has been criticized for extensive government intervention and significant expropriation of minority shareholders by majority shareholders and corporate managers (Jian and Wong, 2008; Jiang et al., 2010), which weaken the demand for high-quality accounting data and audit services. Research on accounting and auditing in China confirms this is the case. For example, DeFond et al. (2000b) find a decline in audit market share among large auditors following the release of new auditing standards in 1995. Chan et al. (2006) provide evidence that local auditors, who have greater economic dependence on local clients and are subject to more political influence from local governments, are inclined to report favorably on local government-owned companies to mitigate probable economic losses. Wang et al. (2008) document that Chinese state-owned enterprises are more likely to hire small auditors from the same region (low-quality auditors). They suggest that this pattern of auditor choice is likely to be explained by SOEs' lack of demand for high-quality audit services. Both the existing literature and anecdotal evidence imply that

² See "Rules Governing the Listing of Securities on the Stock Exchange of Hong Kong Limited (Chapter 4)."

³ DeFond et al. (2000a) reported that the Big 6 firms had approximately 80% market share as measured by the number of listed clientele.

reputation considerations are less likely to drive the behavior of auditors in China's audit market.

To date, numerous studies have examined the quality differentials between Big 4 auditors and non-Big 4 auditors. The evidence supports the notion that Big 4 accounting firms supply higher-quality audits (see the review by Francis (2004)). However, some studies also indicate that differences in the proxies for audit quality between Big 4 and non-Big 4 audit firms could be a reflection of their respective clients' characteristics (e.g., Lawrence et al., 2011), especially in non-US audit markets. Using a cross-country sample from 1994 to 2004, Francis and Wang (2008) find no difference in the earnings quality of Big 4 and non-Big 4 clients when investor protection is very weak. This suggests that in the absence of investor protection, Big 4 auditors simply do not have incentives to enforce high-quality earnings and risk dismissal by their clients. By investigating several audit proxies (e.g., propensity to issue modified audit opinions, discretionary accruals), Liu and Zhou (2007) find that audit quality differentials between Big 4 firms and non-Big 4 firms do not exist in China's A-share market. However, studies also provide evidence that Big 4 firms play a stronger governance role in emerging markets and charge higher audit fees (e.g., Fan and Wong, 2005; Choi and Wong, 2007; Choi et al., 2008). The mixed and inconclusive results on the quality differential between Big 4 firms and non-Big 4 firms in emerging markets motivate the present study.

If a CL firm's domestic and overseas auditors are member firms of the same international Big 4 accounting firm, then investors should expect the two auditors to have similar professional judgment for the transactions and events of the same firm. Given that overseas (Hong Kong) Big 4 auditors provide high-quality audits in the Hong Kong market, and due to the deterrent effect of sharing the same international brand name, the domestic Big 4 auditor is unlikely to allow managers to opportunistically report its domestic earnings because it needs to take the reputation of its Hong Kong counterpart into account. In contrast, if the Hong Kong auditor does not supply high-quality audits, and/or the domestic auditor does not have the same brand name as the overseas auditor, then the deterrent effect is weak and domestic auditors would not necessarily supply higher quality audits for CL firms. In our sample, if a CL firm's domestic auditor is a Big 4 firm, then the firms' overseas auditor is generally the same brand name Big 4 firm. Conversely, if the domestic auditor is a non-Big 4 firm, then the firms' overseas auditor generally does not share the same brand name. Therefore, we conjecture that domestic Big 4 auditors should be more effective at containing CL firms' aggressive or opportunistic reporting of domestic earnings than non-Big 4 domestic auditors.

3. The association between auditor choice and accruals

3.1. Data

We first obtain a list of A-share companies whose shares were cross-listed on HKEx (H-shares) at the end of 2008 from the CSMAR database. We then identify the listing date on the Chinese stock market (the Shanghai Stock Exchange and the Shenzhen Stock Exchange) and HKEx to determine the first cross-listing calendar-year for each CL firm. We discard firms in the finance industry because the characteristics of accruals for this industry differ from other industries. We thereby obtain 324 cross-listed firm-year observations for the period 1998–2008. Our sample period starts from 1998 because that is when

Table 1
Frequencies of cross-listed firms from 1998 to 2008.

		Observations		Frequency		
<i>Panel A: Auditor type analysis</i>						
Total		324		100.00		
<i>Domestic auditors</i>						
– Big 4		229		70.67		
– Non-Big 4		95		29.33		
<i>Overseas auditors</i>						
– Big 4		290		89.51		
– Non-Big 4		34		10.49		
<i>Domestic and overseas auditors are the same</i>						
– The same Big 4		225		69.44		
– The same Non-Big 4		12		3.70		
Year	<u>Big 4 audits</u>		<u>Non-Big 4 audits</u>		<u>Total</u>	
	Observations	Frequency	Observations	Frequency	Observations	Frequency
<i>Panel B: Year analysis</i>						
1998	12	3.70	6	1.85	18	5.55
1999	14	4.32	5	1.54	19	5.86
2000	13	4.01	6	1.85	19	5.86
2001	17	5.24	7	2.16	24	7.40
2002	19	5.86	8	2.46	27	8.33
2003	20	6.17	9	2.78	29	8.95
2004	22	6.79	9	2.78	31	9.57
2005	22	6.79	8	2.47	30	9.26
2006	26	8.02	9	2.78	35	10.80
2007	32	9.87	13	4.01	45	13.89
2008	32	9.87	15	4.62	47	14.51
Total	229	70.67	95	29.33	324	100.00
<i>Panel C: Industry analysis</i>						
Mining	29	8.95	1	0.30	30	9.26
Manufacturing	127	39.20	61	18.82	188	58.02
Utilities	16	4.93	0	0.00	16	4.94
Construction	4	1.23	0	0.00	4	1.23
Transportation	35	10.80	21	6.48	56	17.28
IT	4	1.23	12	3.70	16	4.94
Real estate	3	0.93	0	0.00	3	0.93
Social Services	11	3.40	0	0.00	11	3.39
Total	229	70.67	95	29.33	324	100.00

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 (excluding finance industry).

Chinese listed companies were first required to disclose their cash-flow statements, which are pivotal for calculating accruals and each component of accruals.

Table 1 provides a breakdown of our sample by auditor type, and by year and industry for Big 4 clients and non-Big 4 clients. As presented in panel A of Table 1, of the 324 cross-listed observations, 229 (70.67%) and 290 (89.51%) sample firms hire Big 4 auditors for domestic financial statements and overseas financial statements, respectively. Note that 225 cross-listed firms hire the same Big 4 firm for both domestic and overseas audits, whereas only 12 non-Big 4 audited cross-listed firms hire the same firm. Although the observations are spread among the industries, approximately 85% are in the manufacturing, transportation and mining industries.⁴

⁴ Our results do not change substantially if we use the firm sample for these three industries alone.

Table 2 presents descriptive statistics of firm characteristics for CL firms audited by domestic Big 4 versus non-Big 4 auditors and results of difference tests between the groups. To mitigate the effects of outliers, all continuous variables are winsorized at the first and 99th percentiles. CL firms with Big 4 auditors are, on average, larger than CL firms with non-Big 4 auditors in terms of total assets and sales. The differences in mean (median) total assets and sales are RMB 44.88 billion (11.30 billion) and RMB 44.76 billion (7.72 billion), respectively, and are statistically significant at the 1% level. The leverage for Big 4 audited CL firms is also significantly higher at the 1% level than that of non-Big 4 audited firms. In terms of accounting performance, CL firms with Big 4 auditors have better ROA and are less likely to make a loss than CL firms with non-Big 4 auditors. In addition, the median market-to-book ratio (MTB) for Big 4 clients is significantly smaller than that of non-Big 4 clients. In contrast, CL firms with Big 4 auditors have greater median sales growth. Therefore, it is unclear whether Big 4 audited firms have higher growth prospects given that both MTB and sales growth could be used as measures of growth opportunities. In general, the above evidence suggests that CL firms with Big 4 auditors are better quality

Table 2
Descriptive statistics of firm characteristics for Big 4 and Non-Big 4 samples.

Variables	Big 4 audits (N = 229) mean (median)	Non-Big 4 audits (N = 95) mean (median)	p-Value for tests of differences (two-tailed)
Total Assets (RMB billion)	56.88 (14.691)	12.001 (3.391)	<0.01 <0.01
Sales (RMB billion)	53.550 (9.790)	8.791 (2.076)	<0.01 <0.01
Size	23.390 23.410	22.31 21.94	<0.01 <0.01
Leverage	0.467 0.449	0.547 0.509	<0.01 <0.01
OCF	0.089 0.089	0.073 0.063	0.10 0.01
ROA	0.040 0.041	0.024 0.026	0.09 0.03
Loss	0.153 0.000	0.326 0.000	<0.01 –
MTB	3.187 2.371	3.660 2.843	0.19 0.04
Sales growth	0.233 0.184	0.176 0.132	0.24 0.02
State ownership	0.539 0.571	0.469 0.482	<0.01 <0.01
Foreign ownership	0.053 0.002	0.047 0.002	0.63 0.65
Protect dummy	0.689 1.000	0.274 0.000	<0.01 –

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 (excluding finance industry). Size is the natural logarithm of total assets at the end of year. Leverage is the ratio of total liabilities to total assets at the end of year. OCF is current operating cash flow divided by average total assets. ROA is return on assets, measured as net income divided by average total assets. Loss is a dummy variable that takes the value of 1 if the company has an operating loss in the current year. MTB is the market-to-book ratio at the end of year. Sales growth is the percentage change in sales over the previous year. State ownership is the percentage of shares owned by state shareholders. Foreign ownership is the percentage of foreign ownership among the 10 largest shareholders at the end of the reporting period. Protect dummy is an indicator of whether firms are from protected industries. Petrochemical, energy, raw materials and transportation are viewed as protected industries. T-tests and rank-sum tests are employed to test the differences in the means and medians of variables, respectively.

Table 3
Firm characteristics and auditor choice.

Variables	Predicted sign	
Size	+	1.021(3.88) ^{***}
Leverage	–	–3.988(–2.17) ^{**}
ROA	+	–10.468(–2.17) ^{**}
Loss	–	–1.209(–2.26) ^{**}
MTB	+	0.035(0.47)
Sales growth	+	0.276(0.67)
State ownership	+	–0.325(–0.14)
Foreign ownership	+	–0.791(–0.33)
Protect dummy	+	0.597(0.78)
Year fixed effect		Yes
N		324
Pseudo-R2		0.248

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 (excluding finance industry). The results are based on the probit model. The dependent variable is the auditor choice dummy variable that takes a value of 1 if clients hire a Big 4 auditor for domestic audits in that year and 0 otherwise. The Z-statistics in parentheses are based on robust standard errors clustered by firm. Other variables are defined in Table 2. The sample is winsorized at the top and bottom 1% of firm-year observations.

^{**} Represent statistical significance at the 5% levels, respectively.

^{***} Represent statistical significance at the 1% levels, respectively.

than CL firms with non-Big 4 auditors in terms of firm size, leverage and performance. In addition, CL firms with Big 4 auditors have higher mean and median state ownership than CL firms with non-Big 4 auditors, and the differences are significant at the 1% level. However, the two groups have similar foreign ownership. Finally, we also check whether Big 4 clients are more likely to be from protected industries than non-Big 4 clients. Following Aharony et al. (2000), we view petrochemical, energy and raw materials as protected industries. We also view firms in the transportation industry as protected firms in terms of monopoly practices in China.⁵ In Table 2, 68.9% of the CL firm-years with Big 4 auditors are from protected industries, compared with 27.4% of the CL firm-years with non-Big 4 audited auditors, and the difference is statistically significant at the 1% level.

3.2. Firm characteristics and auditor choice

In addition to the descriptive evidence presented in Table 2, we also run a probit regression for the pooled sample of 324 firm-year observations to investigate how firm characteristics affect auditor choice for CL firms. The dependent variable is a dichotomous indicator for Big 4 versus non-Big 4 domestic auditors. The independent variables include firm size (natural log of total assets), leverage, ROA,⁶ loss, market-to-book (MTB), sales growth, state ownership, foreign ownership and a protected industry dummy. We also control for calendar-year fixed effects. The coefficients and the corresponding z-values based on robust standard errors corrected for heteroskedasticity are presented in Table 3. We find that only size, leverage, ROA and loss have statistically significant coefficients. Consistent with

⁵ The results presented in the following tables do not change if we view transportation as an unprotected industry.

⁶ If we use OCF to replace ROA as a measure of accounting performance in Table 3, then the coefficient for OCF is –4.504 and significant at the 5% level, similar to ROA.

the auditor choice literature (e.g., Francis et al., 1999), the results in Table 3 show that Big 4 auditors are more likely to be used by large and lower-leverage firms. In addition, loss firms are less likely to have Big 4 auditors. However, inconsistent with prior research and the descriptive evidence in Table 2, the coefficient of ROA is negative and statistically significant at the 5% level. This suggests that the ROA effect may be conditional on other explanatory variables.⁷ In conclusion, the main drivers for firms using Big 4 auditors are firm size and leverage.

3.3. Auditor choice and accruals

In an attempt to capture the effects of auditor choice on accruals patterns, we use two measures of accruals according to the previous literature. First, we examine the association between auditor choice and total accruals because the literature suggests that accruals models have limited predictive accuracy and power to detect earnings management (e.g., Dechow et al., 1995; Kang and Sivaramakrishnan, 1995), and this problem may be more serious in emerging markets such as China. Total accruals (TAC) is measured as the difference between net income (NI) and cash flows from operating activities (CFO) divided by average total assets.⁸ Second, in line with prior literature (e.g., DeFond and Park, 2001; Carey and Simnett, 2006; Francis et al., 2009), we use abnormal working capital accruals (AWCA) as a second accruals measure. DeFond and Park (2001) find AWCA to be a more powerful test in comparison to using total accruals. In addition, prior research also suggests that management has the greatest discretion over working capital accruals (Ashbaugh et al., 2003; Becker et al., 1998). Specifically, the measure is:

$$AWCA_t = WC_t - [(WC_{t-1}/S_{t-1}) * S_t], \quad (1)$$

where t is the year and $t - 1$ refers to the prior year; WC_t , the non-cash working capital in the current year computed as (current assets–cash and short-term investment)–(current liabilities–short-term debt); WC_{t-1} , the non-cash working capital in the previous year; S_t , the sales in the current year; and S_{t-1} is the sales in the previous year.

We scale all variables by average total assets according to Carey and Simnett (2006). In addition to investigating the absolute amount of accruals, we also distinguish between accruals according to their sign because the literature suggests that income-increasing accruals have different risks and implications from income-decreasing accruals (e.g., Kim et al., 2003).

Table 4 reports the univariate analysis for the accruals measures for Big 4 and non-Big 4 clients. We conduct parametric (t-tests) and nonparametric tests (rank-sum tests) to examine whether the differences in accruals measures for the two groups are statistically significant. The results presented in panel A indicate that CL firms audited by Big 4 auditors have lower absolute total accruals than CL firms with non-Big 4 auditors. The mean unsigned total accruals for non-Big 4 clients is 0.083, approximately 30% more than

⁷ We regress auditor choice on ROA by itself and find that the sign for ROA is positive but insignificant. We then add the other explanatory variables one-by-one and find that LOSS and SIZE cause the coefficient of ROA to be significantly negative. Indeed, the correlation coefficient is -0.66 between ROA and Loss and 0.23 between ROA and Size.

⁸ As a robustness check, we also use industry-year median adjusted TAC (IATAC) as an alternative measure of accruals to control for the common determinants of accruals among firms within the same industry and calendar effects. The results are qualitatively identical.

Table 4
Univariate analysis of accruals.

Accruals variables		Big 4 Audits		Non-Big 4 Audits		p-value for tests of differences (two-tailed)
		N	Value	N	Value	
<i>Panel A: Total accruals analysis</i>						
TAC	Mean	229	0.063	95	0.083	0.01
	Median	229	0.052	95	0.063	0.12
	Std.	229	0.053	95	0.080	
TAC (TAC ≥ 0)	Mean	42	0.041	29	0.052	0.34
	Median	42	0.023	29	0.040	0.12
	Std.	42	0.049	29	0.043	
TAC (TAC < 0)	Mean	187	0.068	66	0.096	<0.01
	Median	187	0.057	66	0.077	0.06
	Std.	187	0.053	66	0.089	
<i>Panel B: Abnormal working capital current accruals analysis</i>						
AWCA	Mean	229	0.072	95	0.123	<0.01
	Median	229	0.046	95	0.062	0.09
	Std.	229	0.078	95	0.223	
AWCA (AWCA ≥ 0)	Mean	120	0.076	46	0.094	0.25
	Median	120	0.053	46	0.050	0.45
	Std.	120	0.084	46	0.095	
AWCA (AWCA < 0)	Mean	109	0.068	49	0.151	<0.01
	Median	109	0.045	49	0.066	0.11
	Std.	109	0.071	49	0.295	

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 (excluding finance industry). TAC is measured as the difference between net income and cash flows from operating activities divided by average total assets. |TAC| is the absolute value of TAC. IATAC is the industry-year median adjusted TAC. AWCA is abnormal working capital accruals. *t*-Tests and rank-sum tests are employed to test the differences in the means and medians of variables, respectively.

Big 4 clients. From the sign of accruals, we find that Big4 clients have lower but statistically insignificant income-increasing accruals than non-Big 4 clients. In terms of income-decreasing accruals, non-Big 4 clients have more negative total accruals than Big 4 clients and the difference is statistically significant. These findings are somewhat inconsistent with the literature. For example, Francis et al. (1999) find firms with higher absolute total accruals more likely to hire Big 4 auditors, even though they have lower discretionary accruals relative to non-Big 4 clients. However, the univariate evidence presented by Becker et al. (1998) suggests this is not the case. In addition, Francis and Krishnan (1999) document that income-increasing accruals are more likely to result in conservative reporting than incoming-decreasing accruals.

In panel B of Table 4, we examine the differences in abnormal working capital accruals between the two types of sample firms. The results based on AWCA are similar to those based on total accruals. Big 4 clients have less absolute abnormal working capital accruals than non-Big 4 clients. Further tests suggest the difference is only statistically significant for income-decreasing accruals.

The purpose of our study is to compare accruals patterns across our Big 4 and non-Big 4 samples. Although we conduct univariate tests, we also use a multivariate test to control for the potential factors that simultaneously affect a firm's choice of auditor and its accruals properties. In our multivariate analysis, the accruals measures are regressed on a dummy variable indicating auditor type and several control variables.

Table 5
Regression analysis of accruals.

	TAC (1)	TAC (TAC \geq 0) (2)	TAC (TAC<0) (3)	AWCA (4)	AWCA (AWCA \geq 0) (5)	AWCA (AWCA<0) (6)
Big 4	–0.002 (–0.29)	–0.009 (–0.97)	0.007 (0.89)	–0.043 (–2.20)**	–0.007 (–0.32)	–0.079 (–1.87)*
Size	–0.006 (–1.69)*	0.014 (2.92)***	–0.011 (–3.10)***	–0.006 (–1.01)	–0.018 (–2.24)**	–0.002 (–0.17)
Leverage	0.097 (2.81)***	–0.026 (–1.02)	0.118 (4.77)***	–0.019 (–0.36)	–0.004 (–0.08)	–0.027 (–0.35)
OCF	0.331 (2.82)***	–0.604 (–5.32)***	0.562 (5.87)***	–0.403 (–2.38)**	–0.107 (–1.20)	–0.734 (–1.99)**
Loss	0.044 (3.26)***	–0.022 (–1.33)	0.065 (5.60)***	–0.025 (–1.58)	–0.048 (–3.06)***	–0.044 (–0.96)
Firm/year cluster	Yes	Yes	Yes	Yes	Yes	Yes
N	324	71	253	324	166	158
R ²	0.281	0.467	0.447	0.094	0.078	0.153

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 (excluding finance industry). This table reports estimates from pooled time-series cross-sectional OLS regressions. The dependent variables are accruals proxies. The dependent and independent variables are defined in Table 2 and Table 4. *t*-Statistics are presented in parentheses below the coefficients and are corrected for heteroskedasticity and cross-sectional and time-series correlation using a two-way cluster at the firm and year level. The sample is winsorized at the top and bottom 1% of firm-year observations.

* Represent statistical significance at the 10% levels, respectively.

** Represent statistical significance at the 5% levels, respectively.

*** Represent statistical significance at the 1% levels, respectively.

The evidence presented in Table 3 indicates that firm size, leverage and firm performance significantly affect auditor choice. Therefore, we include size, leverage, loss and OCF in the regressions.⁹ We do not include ROA, because accruals are a component of earnings. We also include year dummies. Because we use unbalanced panel data, there could be both time-series and cross-sectional interdependence in the error terms of the OLS regression. There could also be heteroskedasticity. Consequently, the OLS standard errors may be biased and either overestimate or underestimate the true variability of the coefficient estimates (Petersen, 2009). Therefore, in calculating the standard errors we adjust for clusters at both the firm and year level, as recommended by Petersen (2009).¹⁰ (http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm). Table 5 presents the results of the multivariate regressions.

In column (1), the coefficient of Big 4 is –0.002 but insignificant, which is inconsistent with the results from the univariate tests presented in Table 4, indicating that the difference in total accruals across the two groups may be induced by other firm characteristics. In columns (2) and (3), we examine the association between auditor choice and income-increasing accruals and income-decreasing accruals after controlling for other factors. Again, the coefficients for Big 4 are not statistically significant.

⁹ We do not include sales growth, MTB, state ownership, foreign ownership or the protected industry dummy in the regression because these variables are not correlated with the choice of auditor (see Table 3). In the matched propensity analysis, these variables are controlled for in the sense that they are included in the auditor choice selection model. Finally, as a robustness check, we include these variables in the regression and our conclusions remain robust after controlling for these effects.

¹⁰ Petersen (2009) documents that standard errors clustered on multiple dimensions are unbiased and produce correctly sized confidence intervals for panel data in corporate finance applications. We use the Stata command *cluster2*, downloaded from Mitchell Petersen's website: (http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm).

In columns (4)–(6), we examine the relationship between auditor choice and abnormal working capital accruals. The coefficient for Big 4 is -0.043 and significant at the 5% level (the t -statistic is -2.20) in column (4), suggesting that Big 4 clients have lower unsigned discretionary accruals than non-Big 4 clients. In columns (5) and (6), we examine the effect of auditor choice on income-increasing and income-decreasing discretionary accruals. Both Big 4 coefficients are negative but only statistically significant for income-decreasing accruals, consistent with the results from the univariate tests in Table 4. Taken together, the evidence from the multivariate regressions suggests that CL firms with Big 4 auditors have lower unsigned discretionary accruals than total accruals compared with CL firms with non-Big 4 auditors. Meanwhile, the differences in income-decreasing discretionary accruals across the two groups of sample firms are larger than income-increasing accruals.

The significant difference between income-decreasing accruals and income-increasing accruals is somewhat inconsistent with the US literature. The results could be induced by managers' strong incentives to "take a big bath" in the Chinese stock market (Li and Li, 2005). Because earnings quality is impaired if earnings are either overstated or understated, our evidence suggests that CL firms with Big 4 auditors are likely to have higher earnings quality than CL firms with non-Big 4 auditors.

Nevertheless, we aim to understand why CL firms audited by non-Big 4 auditors have more negative abnormal accruals than CL firms audited by Big 4 auditors. First, we assume that auditors only have incentives to contain their clients' accruals choice when their earnings management exceeds a certain threshold. Further, we predict that the audit quality differential between Big 4 and non-Big 4 should be more significant for extremely large abnormal accruals. To test this prediction, in Fig. 1 we plot the frequency distribution based on deciles of signed abnormal working capital accruals (AWCA) for Big 4 and non-Big 4 clients, respectively.

In Fig. 1, for the lowest interval (Interval 1, the lowest 10%) of AWCA, the frequency is 16% for non-Big 4 clients and 8% for Big 4 clients. For the highest interval (Interval 10, the highest 10%) of AWCA, the frequency is 14% for non-Big 4 and 8% for Big 4. That is, 30% of non-Big 4 clients have either the lowest negative AWCA or the highest positive AWCA, whereas this amount is only 16% for Big 4 clients. This preliminary evidence suggests that Big 4 auditors are more effective in deterring clients from extreme income-increasing or income-decreasing earnings management than Non-Big 4 auditors.

According to our previous findings, there is an insignificant difference in income-increasing AWCA between Big 4 and Non-Big 4 clients. One reason for this finding may be the small sample size, which reduces the power of the tests. After all, according to

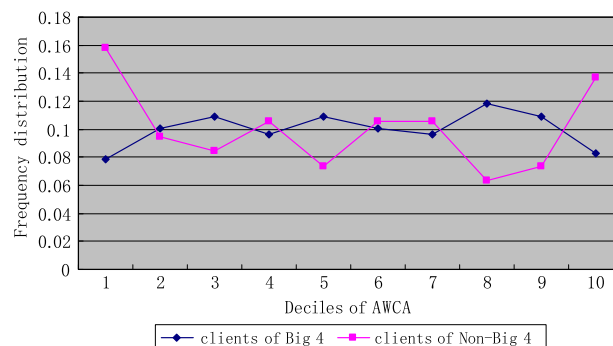


Fig. 1. CL Clients' frequency distribution based on deciles of abnormal working capital accruals (AWCA).

Table 6

Analysis of “big bath” and the reversal of abnormal working capital accruals: CL clients of Big 4 versus CL clients of non-Big 4.

	The lowest 10% of AWCA in year t (Decile 1)		
	Big 4 mean (median) [N]	Non Big 4 mean (median) [N]	Difference tests (p -value, one-tailed)
$\Delta AWCA_{t+1}$	0.228 (0.220) [17]	0.382 (0.334) [12]	0.10 0.09
$\Delta AWCA_{t+2}$	0.265 (0.230) [14]	0.404 (0.343) [10]	0.07 0.06

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 with extremely negative (the lowest 10%) AWCA. $\Delta AWCA_{t+1}$ is calculated as the difference between $AWCA_{t+1}$ and $AWCA_t$. $\Delta AWCA_{t+2}$ is calculated as the difference between $AWCA_{t+2}$ and $AWCA_t$. t -Tests and rank-sum tests are employed to test the differences in the means and medians of variables (one-tailed), respectively.

Fig. 1 and anecdotal evidence, the audit-quality differential between high-quality auditors and low-quality auditors is only apparent when clients have extreme opportunistic earnings management.

For negative (income-decreasing) AWCA, we conjecture that clients have “big bath” incentives, and Big 4 auditors are more effective than non-Big 4 auditors in constraining the “big bath” behavior of clients. However, other factors (e.g., losses) could induce non-Big 4 clients to have more negative abnormal accruals than Big 4 clients.

The purpose of “taking a big bath” is to reverse accruals in the future. Accordingly, we predict that future reversals in abnormal accruals should be high for “big bath” clients. To examine this argument, we calculate the change in AWCA from year t to year $t + 1$ (and year $t + 2$) for extremely negative AWCA groups and compare the difference in $\Delta AWCA$ between Big 4 and non-Big 4 clients. Table 6 presents the results.

Clients with large negative abnormal working capital accruals in year t have larger reversals in year $t + 1$ and year $t + 2$. Table 6 shows that the mean (median) change in AWCA in year $t + 1$ ($\Delta AWCA_{t+1}$) is 0.228 (0.220) and 0.382 (0.334) for Big 4 and non-Big 4 clients, respectively. A one-tailed t -test (rank sum test) shows the difference is significant at the 10% level. The analysis of $\Delta AWCA_{t+2}$ shows similar results. The evidence presented in Fig. 1 and Table 6 suggests that non-Big 4 clients are more likely to “take a big bath” than Big 4 clients. Although we cannot completely rule out alternative explanations, our evidence implies that Big 4 auditors provide higher-quality audits for CL firms than non-Big 4 auditors.

4. Additional tests

4.1. Auditor choice and accruals patterns for AB firms

So far, we find that CL firms that appoint Big 4 firms for domestic audits have lower absolute abnormal working capital accruals than other CL firms. Our explanation is that domestic member firms of the international Big 4 need to take the reputation of their Hong Kong counterparts into account because they share the same international brand name and therefore have an incentive to constrain their clients’ aggressive reporting behavior. One might conjecture that the differences in the two groups’ accruals patterns could be

Table 7
Regression analysis of accruals using the “A+B share” sample.

Dependent variables	TAC (1)	TAC (TAC \geq 0) (2)	TAC (TAC<0) (3)	AWCA (4)	AWCA (AWCA \geq 0) (5)	AWCA (AWCA<0) (6)
Big 4	0.021 (2.94) ^{***}	0.015 (2.45) ^{**}	0.012 (1.55)	-0.010 (-0.64)	-0.009 (-0.70)	-0.021 (-0.70)
Size	-0.005 (-1.49)	0.001 (0.31)	-0.011 (-3.69) ^{***}	-0.016 (-2.02) ^{**}	-0.005 (-0.74)	-0.017 (-1.17)
Leverage	0.091 (3.74) ^{***}	0.014 (0.78)	0.113 (4.40) ^{***}	0.160 (2.95) ^{***}	0.066 (2.80) ^{***}	0.180 (2.70) ^{***}
OCF	0.218 (3.19) ^{***}	-0.619 (-9.22) ^{***}	0.599 (12.39) ^{***}	-0.243 (-1.81) [*]	-0.286 (-2.69) ^{***}	-0.254 (-1.15)
Loss	0.053 (9.13) ^{***}	-0.041 (-5.02) ^{***}	0.085 (11.60) ^{***}	0.039 (1.29)	-0.021 (-2.23) ^{**}	0.038 (0.67)
Firm/Year cluster	Yes	Yes	Yes	Yes	Yes	Yes
N	755	229	526	755	387	368
R ²	0.316	0.543	0.523	0.138	0.095	0.139

Notes: The sample is comprised of A-share listed companies with B-shares from 1998 to 2006 (excluding finance industry). This table reports estimates from pooled time-series cross-sectional OLS regressions. The dependent variables are accruals proxies. The dependent and independent variables are defined in Table 2 and Table 4. *t*-statistics are presented in parentheses below the coefficients and are corrected for heteroskedasticity and cross-sectional and time-series correlation using a two-way cluster at the firm and year level. The sample is winsorized at the top and bottom 1% of firm-year observations.

^{*} Represent statistical significance at the 10% levels, respectively.

^{**} Represent statistical significance at the 5% levels, respectively.

^{***} Represent statistical significance at the 1% levels, respectively.

created by dual-audits per se. That is, two Big 4 auditors may have higher audit quality than other auditor pairs (Francis et al., 2009). Fortunately, the Chinese setting allows us to rule out this alternative explanation, because Chinese-listed companies with B-shares were also required to conduct a dual-audit before 2007.¹¹ Unlike the Hong Kong audit market, the B-share audit market is greatly affected by Chinese institutional forces. For example, it has the same monitors (the two stock exchanges and the CSRC) and similar investors to the A-share audit market.¹² Therefore, if auditors have a similar incentive to conduct audits in both the B-share and the A-share markets, and if Big 4 firms do not supply higher audit quality in the A-share market, as documented in the literature (Liu and Zhou, 2007), then we would not expect accruals patterns to be strongly associated with auditor choice for B-share firms. In examining the propensity to issue modified audit opinions, Li and Wu (2003) find no evidence that supplementary auditing in the B-share market improves audit quality.

To analyze this issue, we examine the association between auditor choice and accruals patterns using a sample of B-share listed firms for the period 1998–2006. We identify 89 AB firms with 755 firm-year observations. Twenty-four and a half percent (185 of 755) of the AB firm-years hired Big 4 auditors for domestic audits. The estimated results are presented in Table 7. The models, variable definitions and estimation methods in Table 7 are consistent with those in Table 5. The results in column (1) show that the coefficient for Big 4 is positive and highly significant at the 1% level, indicating that the B-share clients of Big 4 auditors have higher accruals than the B-share clients of non-Big 4 auditors. Further tests

¹¹ On September 12, 2007, the CSRC released a notice that cancelled the requirement for dual audits in the B-share market.

¹² Before 2001, Chinese listed companies issued B-shares (denominated in foreign currencies) to foreign investors. Since February 19, 2001, domestic investors have been allowed to use their legitimate holdings of foreign currency to trade B-shares according to the announcement issued by the CSRC.

reported in columns (2) and (3) suggest that AB firms audited by Big 4 firms have significantly higher income-increasing total accruals than AB firms audited by non-Big 4 firms. Considering the results using abnormal working capital accruals in columns (4)–(6), three of the coefficients for Big 4 are negative but insignificant, suggesting that there is no systematic association between auditor choice and discretionary accruals. Overall, the evidence reported in Table 7 suggests that Big 4 auditors are not more effective at constraining clients' aggressive earnings reporting than non-Big 4 auditors in the B-share market, consistent with our prediction and with prior studies in China. The evidence also indicates that dual-audits per se do not improve clients' quality of earnings, contrary to the findings reported by Francis et al. (2009).

4.2. Analysis of industry-adjusted accruals components

In Tables 4 and 5, we find some evidence that CL firms with non-Big 4 auditors are more likely to understate their earnings than CL firms with Big 4 auditors. A natural question is how CL firms manage their earnings. We aim to answer this by examining the differences in the accruals components between clients of Big 4 auditors and clients of non-Big 4 auditors. Specifically, we compute four accruals components: depreciation and amortization (DEPAMO), provision for asset impairment (PAIM), annual change in inventory (Δ INV) and annual change in accounts receivable (Δ AR). To remove size and industry effects, the four accruals components are scaled by average total assets and adjusted by industry-year median values. In Table 8, we present the four accruals components separately for Big 4 and non-Big 4 subsamples and conduct difference tests. The results show that the mean and median DEPAMO and Δ AR are similar for the two groups. However, the mean (median) PAIM is 0.005 (–0.000) for Big 4 clients, which is lower than for non-Big 4 clients. The differences are statistically significant, indicating that clients of non-Big 4 auditors write down more asset impairment losses. The finding that Big 4 audit clients have a lower provision for impairment losses may explain why CL firms with Big 4 auditors have lower income-decreasing accruals than CL firms with non-Big 4 auditors. In terms of the change in inventory, although the t-test suggests that Big 4 audit clients have a greater positive increase in inventory than non-Big 4 clients (the p -value is 0.04), the rank-sum test indicates that the difference in Δ INV is insignificant (the p -value is only 0.36). In summary, the evidence presented in Table 8 shows that asset impairment is an

Table 8
Analysis of industry-adjusted accruals components.

Accruals components	Big 4 Audits (N=229)		Non-Big 4 Audits (N=95)		p -Value for tests of differences (two-tailed)	
	Mean	Median	Mean	Median	t -test	Rank-sum test
DEPAMO	0.011	0.009	0.010	0.006	0.37	0.28
PAIM	0.005	–0.000	0.009	0.002	0.07	0.04
Δ INV	0.010	0.000	–.001	0.001	0.04	0.36
Δ AR	0.016	0.008	0.019	0.015	0.57	0.63

Notes: The sample is comprised of A-share listed companies with H-shares from 1998 to 2008 (excluding finance industry). DEPAMO is the industry-year adjusted depreciation and amortization scaled by average total assets in the year. PAIM is the industry-year adjusted provision for asset impairment scaled by average total assets in the year. Δ INV is the industry-year adjusted annual change in inventory scaled by average total assets. Δ AR is the industry-year adjusted annual change in accounts receivable scaled by average total assets in the year. T-tests and rank-sum tests are employed to test the differences in the means and medians of variables, respectively.

important factor in explaining the accruals pattern differential between clients of Big 4 and non-Big 4 auditing firms.

4.3. Using a matched sample

There is an endogeneity concern for the above findings because auditor choice is not random. Big 4 firms are more likely to choose clients with high earnings quality to mitigate reputation and/or litigation losses. Clients with lower earnings quality may also prefer to select non-Big 4 auditors to reduce costs (Johnson and Lys, 1990). To an extent, this self-selection bias could be an alternative explanation for the difference in the accruals patterns of Big 4 and non-Big 4 clients. Many previous studies apply the Heckman two-stage model to correct for this selectivity problem. However, Francis and Lennox (2008) point out that many accounting researchers have been misusing the Heckman model. As an alternative and preferable technique, Francis and Lennox (2008) suggest using “matched propensity scores,” thus avoiding the need to impose any exclusion restrictions as in the Heckman model. Several recent auditing studies have applied the matched propensity approach (e.g., Chan and Wu, 2011; Lawrence et al., 2011).

Following Francis and Lennox (2008), we implement the matching technique by first estimating a probit model to predict the propensity for CL firms to choose Big 4 auditors, using the pooled 324 CL firm-year observations. The explanatory variables are the same as those in Table 3. We then sort the sample by the predicted probabilities. For each Big 4 client-year observation, we identify the two observations that have the closest predicted probabilities and adopt the following matching rule: (a) if only one of the two potential matches is a non-Big 4 client, then we choose that one as the match; (b) if both potential

Table 9
Univariate analysis of accruals using a propensity-score matched sample.

Accruals variables		Big 4 Audits	Non-Big 4 Audits	p-value for tests of differences (two-tailed)
<i>Panel A: Total accruals analysis</i>				
TAC	Mean	0.063	0.083	0.12
	Median	0.049	0.057	0.26
	N.	73	73	
TAC (TAC ≥ 0)	Mean	0.047	0.040	0.63
	Median	0.032	0.033	0.81
	N	20	20	
TAC (TA < 0)	Mean	0.069	0.097	0.06
	Median	0.061	0.077	0.13
	N	53	53	
<i>Panel B: Abnormal working capital current accruals analysis</i>				
AWCA	Mean	0.082	0.137	0.07
	Median	0.059	0.092	0.08
	N	73	73	
AWCA (AWCA ≥ 0)	Mean	0.097	0.098	0.98
	Median	0.068	0.078	0.35
	N	36	34	
AWCA (AWCA < 0)	Mean	0.067	0.171	0.06
	Median	0.042	0.111	0.07
	N	37	39	

Notes: The sample includes 73 Big 4 client-year observations and 73 matched observations of non-Big 4 client-years using the propensity score matching approach. T-tests and rank-sum tests are employed to test the differences in the means and medians of variables (two-tailed), respectively.

Table 10
Regression analysis of accruals using a propensity-score matched sample.

	TAC (1)	TAC (TAC \geq 0) (2)	TAC (TAC<0) (3)	AWCA (4)	AWCA (AWCA \geq 0) (5)	AWCA (AWCA<0) (6)
Big 4	-0.013 (-1.87)*	0.003 (0.23)	-0.013 (-1.44)	-0.068 (-2.91)***	-0.002 (-0.05)	-0.114 (-1.94)*
Size	-0.012 (-1.48)	0.021 (2.32)**	-0.199 (-1.71)*	0.001 (0.04)	-0.011 (-0.85)	0.005 (0.34)
Leverage	0.137 (2.56)**	-0.097 (-1.58)	0.169 (2.87)***	-0.014 (-0.17)	0.044 (0.38)	-0.053 (-0.51)
OCF	0.372 (2.43)**	-0.678 (-4.15)***	0.627 (2.81)***	-0.658 (-2.45)**	-0.033 (-0.14)	-1.204 (-2.32)**
Loss	0.053 (2.78)***	-0.032 (-2.96)***	0.077 (4.54)***	-0.019 (-0.81)	-0.022 (-0.76)	-0.051 (-0.87)
Firm/Year cluster	Yes	Yes	Yes	Yes	Yes	Yes
N	146	40	106	146	70	76
R ²	0.338	0.552	0.469	0.110	0.024	0.209

Notes: The sample includes 73 Big 4 client-year observations and 73 matched non-Big 4 client-year observations using the propensity score matching approach. This table reports estimates from pooled time-series cross-sectional OLS regressions. The dependent variables are accruals proxies. The dependent and independent variables are defined in Table 2 and Table 4. *t*-statistics are presented in parentheses below the coefficients and are corrected for heteroskedasticity and cross-sectional and time-series correlations, using a two-way cluster at the firm and year level. The sample is winsorized at the top and bottom 1% of firm-year observations.

* Represent statistical significance at the 10% levels, respectively.

** Represent statistical significance at the 5% levels, respectively.

*** Represent statistical significance at the 1% levels, respectively.

matches are non-Big 4 clients, then we choose the one with the closest predicted probability; and (c) if both potential matches are Big 4 clients, then we determine that there is no suitable match. This rule ensures that we obtain extremely close matches, implying that the scored distributions are virtually identical for Big 4 and non-Big 4 clients. We are able to identify 73 pairs of firm-year observations. We then use these 146 observations to compare the accruals patterns for Big 4 CL and non-Big 4 CL clients.

Tables 9 and 10 present the results for the univariate analysis and multivariate analysis, respectively. The results in Table 9 show that Big 4 clients have a smaller absolute amount of accruals, especially for abnormal working capital accruals. In Table 10, the coefficients for Big 4 are negative and statistically significant in column (1) and column (4), reinforcing the conclusion from the univariate analysis. From the signed accruals tests, we also find that non-Big 4 clients have more negative abnormal working capital accruals than Big 4 clients, similar to the findings in Table 5. Therefore, the evidence from the matched-pairs technique supports our conclusion that Big 4 audits are associated with firms' accruals patterns.

5. Conclusion

This study examines the association between auditor choice and accruals properties using a sample of Chinese firms that cross-list their shares on HKEx over the period 1998–2008. We find that the clients of Big 4 auditors have lower unsigned accruals, especially discretionary accruals, relative to the clients of non-Big 4 auditors. In addition, we find that non-Big 4 clients are more likely to understate their earnings than Big 4 clients. The results are robust to controlling for firm characteristics and using a matched sample. Moreover, using a sample of listed firms with B-shares, we find that the results cannot be

explained by dual-audits per se. Taken together, our evidence suggests that Big 4 firms play a meaningful role in enhancing the earnings quality of cross-listed firms, which helps to explain why cross-listed firms have higher earnings quality than their domestic counterparts, as documented in the extant literature. The findings also suggest that reputation shaped by the institutional environment can change Big 4 incentives in an emerging market.

The study is subject to numerous caveats. The most significant limitation is the small sample size, and the results should therefore be interpreted with caution. In addition, we assume that the observed difference in the accruals patterns of Big 4 audit clients and non-Big 4 audit clients is driven by the auditing quality differential between Big 4 and non-Big 4 firms. It may be that we do not adequately control for other unobserved differences between the two groups and that these may be driving the observed differences in accruals patterns.

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References

- Aharony, J., Lee, Z., Wong, T., 2000. Financial packaging of IPO firms in China. *Journal of Accounting Research* 38, 103–126.
- Ashbaugh, H., LaFond, R., Mayhew, B., 2003. Do nonaudit services compromise auditor independence? Further evidence. *Accounting Review* 78, 611–639.
- Ball, R., Robin, A., Wu, J., 2003. Incentives vs. Standards: properties of accounting numbers in four East Asian countries. *Journal of Accounting and Economics* 36, 235–270.
- Becker, C.L., DeFond, M.L., Jiambalvo, J., Subramanyam, K.R., 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15, 1–24.
- Bushman, R., Piotroski, J., 2006. Financial reporting incentives for conservative accounting: the influence of legal and political institutions. *Journal of Accounting and Economics* 42, 107–148.
- Carey, P., Simnett, R., 2006. Audit partner tenure and audit quality. *Accounting Review* 81, 653–676.
- Chan, K., Lin, K., Mo, P., 2006. A political-economic analysis of auditor reporting and auditor switches. *Review of Accounting Study* 11, 21–48.
- Chan, K., Wu, D., 2011. Aggregate quasi rents and auditor independence. Evidence from audit firm mergers in China. *Contemporary Accounting Research* 28, 175–213.
- Choi, J.-H., Wong, T., 2007. Auditors' governance functions and legal environments: an international investigation. *Contemporary Accounting Research* 24, 13–46.
- Choi, J.H., Kim, J.B., Liu, X., Simunic, D., 2008. Audit pricing, legal liability regimes, and Big 4 premiums: theory and cross-country evidence. *Contemporary Accounting Research* 25, 55–99.
- Dye, R., 1993. Auditing standards, legal liability, and auditor wealth. *Journal of Political Economy* 101, 887–914.
- DeAngelo, L., 1981. Auditor size and audit quality. *Journal of Accounting and Economics* 3, 183–199.
- Dechow, P., Sloan, R., Sweeney, A., 1995. Detecting earnings management. *Accounting Review* 70, 193–225.
- DeFond, M.L., Francis, J., Wong, T., 2000a. Auditor industry specialization and market segmentation evidence from Hong Kong. *Auditing: A Journal of Practice and Theory* 19, 49–67.
- DeFond, M., Park, C., 2001. The reversal of abnormal accruals and the market valuation of earnings surprises. *Accounting Review* 76, 375–404.

- DeFond, M.L., Wong, T.J., Li, S.H., 2000b. The impact of improved auditor independence on audit market concentration in China. *Journal of Accounting and Economics* 28, 269–305.
- Fan, P.H., Wong, T., 2005. Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia. *Journal of Accounting Research* 43, 35–72.
- Firth, M., Lau, T., 2004. Audit pricing following mergers of accounting practices: evidence from Hong Kong. *Accounting and Business Research* 34, 201–213.
- Francis, J., Krishnan, J., 1999. Accounting accruals and auditor reporting conservatism. *Contemporary Accounting Research* 16, 135–165.
- Francis, J., Maydew, E., Spark, H., 1999. The role of Big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice and Theory* 18, 17–34.
- Francis, J., Richard, C., Vanstraelen, A., 2009. Assessing France's joint audit requirement: are two heads better than one? *Auditing: A Journal of Practice and Theory* 28, 35–63.
- Francis, J., 2004. What do we know about audit quality? *The British Accounting Review* 36, 345–368.
- Francis, J., Lennox, C., 2008. Selection models in accounting research. Working paper, University of Missouri at Columbia and the Hong Kong University of Science & Technology.
- Francis, J., Wang, D., 2008. The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research* 25, 157–191.
- Huikgen, C., Lubberink, M., 2005. Earnings conservatism, litigation and contracting: the case of cross-listing firms. *Journal of Business Finance and Accounting* 32, 1275–1309.
- Jian, Ming, Wong, T.J., 2008. Propping through related party transactions. *Review of Accounting Studies* 15 (1), 70–105.
- Jiang, Guohua., Lee, Charles.M.C., Yue, Heng., 2010. Tunneling through inter-corporate loans: the China experience. *Journal of Financial Economics* 98, 1–20.
- Johnson, W., Lys, T., 1990. The market for audit services: evidence from voluntary auditor changes. *Journal of Accounting and Economics* 12, 281–308.
- Kang, S.-H., Sivaramakrishnan, K., 1995. Issues in testing earnings management and an instrumental variable approach. *Journal of Accounting Research* 33, 353–367.
- Khurana, I., Raman, K., 2004. Litigation risk and the financial reporting credibility of Big 4 vs. Non-Big 4 audits: evidence from Anglo American countries. *Accounting Review* 79, 473–495.
- Kim, J., Chung, R., Firth, M., 2003. Auditor conservatism, asymmetric monitoring, and earnings management. *Contemporary Accounting Research* 20, 323–359.
- Lang, M., Raedy, J., Yetman, M., 2003. How representative are firms that are cross-listed in the United States? An analysis of accounting quality. *Journal of Accounting Research* 41, 363–397.
- Lawrence, A., Minutti-Meza, M., Zhang, P., 2011. Can Big 4 versus Non-Big 4 differences in audit-quality proxies be attributed to client characteristics? *Accounting Review* 86, 259–286.
- Lennox, C., 1999. The relationship between auditor accuracy and auditor size: An evaluation of reputation and deep pockets arguments. *Journal of Business Finance and Accounting* 26, 779–806.
- Leuz, C., Nanda, D., Wysocki, P., 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69, 505–527.
- Leuz, C., 2006. Cross listing, bonding and firms' reporting incentives: A discussion of Lang, Raedy and Wilson (2006). *Journal of Accounting and Economics* 42, 285–299.
- Li, Y., Li, R., 2005. The impact of earnings management on accounting conservatism: Empirical evidence from listed companies in mainland china. *China Accounting and Finance Review* 7, 32–56.
- Li, S., Wu, X., 2003. Supplementary audit patterns and auditor independence. Evidence from China's B share market. *China Accounting and Finance Review* 5 (3), 72–101.
- Liu, F., Zhou, F., 2007. Does size really matter? *Accounting Research in China* 3, 79–88.
- Petersen, M., 2009. Estimating standard errors in finance panel data sets: comparing approaches. *Review of Financial Studies* 22, 435–480.
- Wang, Q., Wong, T.J., Xia, L., 2008. State ownership, the institutional environment, and auditor choice. evidence from China. *Journal of Accounting and Economics* 46, 112–134.
- Weber, J., Willenborg, M., Zhang, J., 2008. Does auditor reputation matter? The case of KPMG Germany and ComROAD AG. *Journal of Accounting Research* 46, 941–972.
- Willenborg, M., 1999. Empirical analysis of the economic demand for auditing in the initial public offerings market. *Journal of Accounting Research* 37, 225–238.